

September 22, 2003

Ms. Phyllis Hockett  
Indiana Department of Transportation  
100 North Senate  
Room N755  
Indianapolis, IN 46204-2249

Re: Registered Construction and Operation Status, **R 097-13755-00284**

Dear Ms. Hockett:

The application from Indiana Department of Transportation, received on December 5, 2000, has been reviewed. Based on the data submitted and the provisions in Sections 1 and 2 of 326 IAC 2-1, it has been determined that the following Quality Assurance Laboratory, to be located at 120 South Shortridge Road, Indianapolis, IN 46219, is classified as registration pursuant to air pollution permit requirements:

One (1) Quality Assurance Laboratory, consisting of:

- (a) One (1) sulfur capping process, using 15 pounds of elemental sulfur flake per week,
- (b) One (1) asphalt extraction process with a solvent usage of 7800 ml of EC-0578 per extraction,
- (c) One (1) asphalt emulsion and asphalt cement testing process, producing waste at a rate of three (3) drums a year, with 55 gallons in a drum,
- (d) One (1) soil compaction process, with a maximum process of 200 pounds of soil per day,
- (e) One (1) coarse and fine aggregate testing process with a maximum process rate of 500 pounds of aggregate per day,
- (f) One (1) aggregate compaction process, with a maximum process rate of 200 pounds of aggregate per day,
- (g) One (1) plastic index and liquid limit testing process, using 50 pounds of aggregate samples per test, and
- (h) Two (2) natural gas fired heating units, each with a heat input capacity of 3.36 million British thermal units per hour (MMBtu/hr).

The following conditions shall be applicable:

- (a) 326 IAC 5-1-2 (Opacity Limitations)  
Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Exemptions), opacity shall meet the following, unless otherwise stated in this permit:
  - (1) Opacity shall not exceed an average of thirty percent (30%) any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

- (2) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute non-overlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.
- (b) Pursuant to 326 IAC 6-3-2 (Particulate Limitations), the-particulate emission rate from the cement testing processes shall each not exceed 0.551 pounds per hour when operating at a process weight rate of less than 100 pounds per hour.

This registration is a renewal issued pursuant to 326 IAC 2-5.5-2.

Any change or modification which may increase the potential VOC emissions to twenty-five (25) tons per year or more, a single HAP emission to ten (10) tons per year or more, or a combination of HAP emissions to twenty-five (25) tons per year or more from the source covered in this registration must be approved by the Office of Environmental Services (OES) and Indiana Department of Environmental Management, Office of Air Quality (IDEM, OAQ) before such change may occur.

Sincerely,

Originally signed by John B. Chavez

John B. Chavez  
Administrator

HMS

cc: File  
Permits - Holly Stockrahm  
Compliance - Matt Mosier  
OAQ - Mindy Hahn

## **Indianapolis Office of Environmental Services**

and

## **Indiana Department of Environmental Management Office of Air Quality**

### **Technical Support Document (TSD) for a Registration Renewal**

#### **Source Background and Description**

|                   |   |
|-------------------|---|
| Source Name:      | Indiana Department of Transportation              |
| Source Location:  | 120 South Shortridge Road, Indianapolis, IN 46219 |
| County:           | Marion  |
| Registration No.: | R097-13755-00284                                  |
| SIC Code:         | Quality Assurance Laboratory                      |
| Permit Reviewer:  | Holly M. Stockrahm                                |

The Office of Environmental Services (OES) and the Indiana Department of Environmental Management, Office of Air Quality (IDEM, OAQ) have reviewed an application for a registration renewal pursuant to 326 IAC 2-5.5-2 from the Indiana Department of Transportation relating to the operation of a Quality Assurance Laboratory, consisting of:

- (a) One (1) sulfur capping process, using 15 pounds of elemental sulfur flake per week,
- (b) One (1) asphalt extraction process with a solvent usage of 7800 ml of EC-0578 per extraction,
- (c) One (1) asphalt emulsion and asphalt cement testing process, producing waste at a rate of three (3) drums a year, with 55 gallons in a drum,
- (d) One (1) soil compaction process, with a maximum process of 200 pounds of soil per day,
- (e) One (1) coarse and fine aggregate testing process with a maximum process rate of 500 pounds of aggregate per day,
- (f) One (1) aggregate compaction process, with a maximum process rate of 200 pounds of aggregate per day,
- (g) One (1) plastic index and liquid limit testing process, using 50 pounds of aggregate samples per test, and
- (h) Two (2) natural gas fired heating units, each with a heat input capacity of 3.36 million British thermal units per hour (MMBtu/hr).

### Stack Summary

| Stack ID | Operation                                    | Height (feet) | Diameter (feet) | Flow Rate (acfm) | Temperature (°F) |
|----------|--|---------------|-----------------|------------------|------------------|
| H901S8   | Asphalt Cement/Asphalt Emulsions             | 19.5          | 0.75'x 0.75'    | 423              | ambient          |
| H901S16  | Asphalt Extraction                           | 22.5          | 0.83'x 0.83'    | 368              | ambient          |
| H901S17  | Asphalt Extraction                           | 22.5          | 0.83'x 0.83'    | 556              | ambient          |
| H901S18  | Coarse/Fine Aggregate Testing                | 20.17         | 1.17'x 1.17'    | 880              | ambient          |
| H901S19  | Asphalt Extraction                           | 22.5          | 0.3'x 0.3'      | 3                | ambient          |
| H901S20  | Asphalt Extraction                           | 22.5          | 0.5'x 0.5'      | 30               | ambient          |
| H901S23  | Soil Compaction, Plastic Index/Liquid Limit  | 22.5          | 1.17'x 1.17'    | 871              | ambient          |
| H901S26  | Soil Compaction, Plastic Index/Liquid Limit  | 21.83         | 1.17'x 1.17'    | 480              | ambient          |
| H901S28  | Cement Tests                                 | 20.3          | 1.17'x 1.17'    | 537              | ambient          |
| H901S38  | Coarse/Fine Aggregate Testing                | 23            | 1.08'x 1.08'    | 1460             | ambient          |
| H901S39  | Coarse/Fine Aggregate Testing                | 23            | 0.5'x 0.5'      | 1725             | ambient          |
| H901S41  | Coarse/Fine Aggregate Testing                | 23            | 0.83'x 0.83'    | 369              | ambient          |
| H901S42  | Coarse/Fine Aggregate Testing                | 23            | 0.83'x 0.83'    | 187              | ambient          |
| H901S43  | Coarse/Fine Aggregate Testing                | 23            | 1.08'x 1.08'    | 2118             | ambient          |
| H901S47  | Sulfur Capping                               | 21            | 1.17'x 1.17'    | 696              | ambient          |
| H901S53  | Asphalt Emulsions                            | 18            | 0.75'x 0.75'    | 113              | ambient          |
| H901S54  | Asphalt Extraction                           | 18            | 0.75'x 0.75'    | 113              | ambient          |
| H901V62  | Asphalt Extraction                           | 4.42          | 1.4'x 1.4'      | 1178             | ambient          |
| H901V63  | Asphalt Extraction                           | 4             | 1.75'x 1.75'    | 2815             | ambient          |
| H901V64  | Coarse/Fine Aggregate Testing and Compaction | 6             | 0.66'x 0.66'    | 1815             | ambient          |

### Recommendation

The staff recommends to the Administrator that the construction and operation be approved. This recommendation is based on the following facts and conditions:

Information, unless otherwise stated, used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on December 5, 2000.

### Emissions Calculations

(a) **Asphalt extraction (VOC):**

Solvent used - EC-0578 with density of 7.15 lb/gal  
Eleven asphalt extractions were performed by Materials and Test Division to determine VOC emissions levels per extraction. The highest solvent loss per extraction was 700 milliliters (ml).

$$\begin{aligned}\text{VOC emissions} &= 7800 \text{ ml} - (7100 \text{ ml} * 0.98) = 842 \text{ ml/extraction} \\ &= 842 \text{ ml} * 0.001 \text{ L/ml} * 0.2642 \text{ gal/liter} * 7.15 \text{ pound/gal} \\ &= 1.59 \text{ lb of VOC per extraction}\end{aligned}$$

where 7800 - clear solvent used

7100 - waste solvent

0.98 - correction for possible asphalt present in waste solvent

The maximum number of extractions performed by the Greenfield District's New Castle lab in 1995 was 1443 over 208 days. So the maximum annual VOC emissions for any INDOT facility is:

$$\begin{aligned}\text{Max Actual VOC emission} &= 1433 \text{ extraction/year} * 1.59 \text{ lb/extraction} = 2295 \text{ lb/yr} \\ \text{Potential VOC emissions} &= 2295 \text{ lb/yr} * \text{yr}/208 \text{ days} * \text{day}/7.5 \text{ hours} = 1.47 \text{ lb/hr} = \mathbf{6.44 \text{ tons/yr}}\end{aligned}$$

(b) **Cement testing particulate (PM) emissions:**

To determine the maximum particulate emissions, the lab conducted a test using the cement testing process which generates the maximum amount of dust. The mass balance shows that 0.27 lb was calculated as missing. Even though most of the dust did not enter the atmosphere but was swept up around the shaker, the 0.27 lb/ test was used as the emission factor.

$$\text{PM}_{10} = (0.27 \text{ lb/test}) * 2 \text{ test}/8 \text{ hours} = 0.0675 \text{ lb/hr}$$

$$\text{Actual emission rate} = 0.27 \text{ lb/test} * 2 \text{ tests/day} * 208 \text{ days/year} = 112.32 \text{ lb/yr}$$

$$\text{Potential PM}_{10} \text{ emission Rate} = 0.675 \text{ lb/hr} * 8760 \text{ hr/yr} * \text{ton}/2000 \text{ lb} = \mathbf{0.3 \text{ tons/yr}}$$

The allowable emission rate under 326 IAC 6-3-2 is 0.551 lb/hr, and the emissions rate for the cement testing is 0.0625 lb/hr, therefore, the source is in compliance.

(c) **Sulfur capping sulfur dioxide (SO<sub>2</sub>) emissions:**

Approximately 15 lbs of elemental sulfur flake are melted in a covered pot once per week. Material balance shows that approximately 7.5 lbs are lost during melting.

$$\text{Actual Sulfur emissions} = 7.5 \text{ lb/week} * 1 \text{ week}/8 \text{ hours actual operations} = 0.94 \text{ lb/hr}$$

$$\text{Potential SO}_2 \text{ emissions} = 0.94 \text{ lb/hr} * 8760 \text{ hr/yr} * \text{ton}/2000 \text{ lb} = \mathbf{4.1 \text{ tons/yr}}$$

- (d) Asphalt emulsion and asphalt cement testing volatile organic compound (VOC) emissions:  
The source uses two (2) solvents for these tests interchangeably - Chloroethene (R) SM or NEU-TRI (R). Greenfield, LaPorte, Vincennes, and Seymour laboratories report usage of one gallon of Chloroethene (R) SM Solvent for every gallon of waste produced. The average concentration of 1,1,1- Trichloroethane in one gallon of waste produced is 87.42%  
The specific gravity of 1,1,1- Trichloroethane is 1.321  
The amount of waste produced in a year is 3-55 gallon drums  
Production hours are 208 days/year \* 8 hours/day = 1664 hours per year

$$\begin{aligned}\text{Estimated HAP (1,1,1- Trichloroethane) emissions when using Chloroethane (R) SM} \\ = 3 \text{ drums/year} * 55 \text{ gallons/drum} * 8.328 \text{ lb/gallon} * 1.321 * \text{year}/1664 \text{ hours} * (87.42\%)\end{aligned}$$

**= 0.95 lb/hr = 4.18 ton/yr**

**Estimated VOC emissions =**

3 drums/year \* 55 gallons/drum \* 8.328 lb/gallon \* 1.321 \* year/1664 hours \* (100 - 87.42%)  
**= 0.137 lb/hr = 0.6 ton/yr**

The average concentration of Trichloroethylene is 81%, and the specific gravity is 1.46

**Estimated HAP (Trichloroethylene) emissions when using NEU-TRI (R)**

= 3 drums/year \* 55 gallons/drum \* 8.328 lb/gallon \* 1.46 \* year/1664 hours \* (81%)  
**= 0.98 lb/hr = 4.28 ton/yr (This is the worst case for HAP from this process)**

**Estimated VOC emissions =**

3 drums/year \* 55 gallons/drum \* 8.328 lb/gallon \* 1.46 \* year/1664 hours \* (100 - 81%)  
**= 0.23 lb/hr = 1.0 ton/yr (This is the worst case for VOC from this process)**

- (e) Two (2) natural gas fired boilers, each with a heat input of 3.36 MM Btu/hr:  
 See Appendix A for calculations.

**Potential to Emit**

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA.”

| Pollutant       | Potential Emissions<br>(tons/year) |
|-----------------|------------------------------------|
| PM              | 0.3                                |
| PM10            | 0.3                                |
| SO <sub>2</sub> | 4.1                                |
| VOC             | 7.44                               |
| CO              | 0                                  |
| NOx             | 0                                  |
| HAP combined    | 4.28                               |
| HAP single      | 4.28                               |

- (a) The potential to emit (as defined in 326 IAC 2-7-1(29)) of the VOC, combined HAPs, and single HAP are greater than the levels listed in 326 IAC 2-1.1-3(e)(1)(exemptions), but less than the levels listed in 326 IAC 2-6.1 (MSOP). Therefore, the source is subject to the provisions of 326 IAC 2-5.1-2 (Registration).

**County Attainment Status**

- (a) Volatile organic compounds (VOC) are precursors for the formation of ozone. Therefore, VOC emissions are considered when evaluating the rule applicability relating to the ozone standards. Marion County has been designated as attainment or unclassifiable for ozone. Therefore, VOC emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

- (b) Marion County has been classified as attainment or unclassifiable for PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub> and CO. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.
- (c) Fugitive Emissions  
Since this type of operation is not one of the 28 listed source categories under 326 IAC 2-2 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive PM emissions are not counted toward determination of PSD and Emission Offset applicability.

### Source Status

Source PSD, Part 70 or FESOP Definition (emissions after controls, based on 8,760 hours of operation per year at rated capacity and/ or as otherwise limited):

| Pollutant        | Emissions<br>(ton/yr) |
|------------------|-----------------------|
| PM               | 0.7                   |
| PM <sub>10</sub> | 0.7                   |
| SO <sub>2</sub>  | 4.1                   |
| VOC              | 7.18                  |
| CO               | 0.6                   |
| NO <sub>x</sub>  | 2.9                   |
| single HAP       | 4.28                  |
| HAPs             | 4.28                  |

This source is a registration because it is not one of the 28 listed source categories and PM, PM<sub>10</sub>, and VOC are each emitted at a rate of 5 tons per year or more, and a single HAP is emitted at a rate of 1 ton per year or more and a combination of HAPs is emitted at a rate of 2.5 tons per year or more.

### Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)

This existing source is not subject to the Part 70 program.

### Federal Rule Applicability

There are no New Source Performance Standards (40 CFR Part 60)(326 IAC 12) applicable to this facility.

This source is not a major source of HAPs, so no National Emission Standards for Hazardous Air Pollutants for Source Categories (40 CFR Part 63) is applicable to this facility.

### State Rule Applicability

326 IAC 5-1-2 (Opacity Limitations)

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

- (a) Opacity shall not exceed an average of thirty percent (30%) any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

**326 IAC 6-1 (Particulate Emission Limitations for Nonattainment Areas)**

The source has a PM potential to emit of less than one hundred (100) tons per year and actual emissions less than 10 tons per year, therefore, 326 IAC 6-1-2 does not apply.

**326 IAC 6-3-2 (Particulate Limitations)**

326 IAC 6-3-2 does not apply to natural gas combustion devices, therefore, this rule does not apply to the boilers.

Pursuant to 326 IAC 6-3-2 (Particulate Limitations), the-particulate emission rate from the cement testing processes shall each not exceed 0.551 pounds per hour when operating at a process weight rate of less than 100 pounds per hour.

**326 IAC 2-4.1 (Air Toxics)**

The source has a HAP potential to emit of less than ten (10) tons per year of a single HAP, and less than twenty-five (25) tons per year of a combination of HAPs, therefore, 326 IAC 2-4.1 does not apply.

**326 IAC 8-1-6 (BACT)**

The source has a VOC potential to emit of less than twenty-five (25) tons per year, therefore, 326 IAC 8-1-6 does not apply.

**326 IAC 8**

There are no other 326 IAC 8 rules applicable to this source.

**Conclusion**

The construction of this soil remediation operation will be subject to the conditions of the attached proposed Registration No. 097-13755-00284.



**Appendix A: Emissions Calculations**  
**Natural Gas Combustion Only**  
**MM BTU/HR <100**  
**Small Industrial Boiler**

Page 1 of 2 TSD App A

Company Name: Indiana Department of Transportation  
Address City IN Zip: 120 South Shortridge Road, Indianapolis, IN 46219  
Permit Number: R097-13755-00284  
Plt ID: 097-00284  
Reviewer: Holly Stockrahm  
Date: 26-Aug-03

Heat Input Capacity  
MMBtu/hr

Potential Throughput  
MMCF/yr

6.7

58.9

|                               | Pollutant |       |     |                      |     |      |
|-------------------------------|-----------|-------|-----|----------------------|-----|------|
|                               | PM*       | PM10* | SO2 | NOx                  | VOC | CO   |
| Emission Factor in lb/MMCF    | 12.0      | 12.0  | 0.6 | 100.0<br>**see below | 5.3 | 21.0 |
| Potential Emission in tons/yr | 0.4       | 0.4   | 0.0 | 2.9                  | 0.2 | 0.6  |

\*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable PM10 combined.

\*\*Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

**Methodology**

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMB

Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-02 (SUPPLEMENT D 3/98)

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

See page 2 for HAPs emissions calculations.

**Appendix A: Emissions Calculations****Natural Gas Combustion Only****MM BTU/HR <100****Small Industrial Boiler****HAPs Emissions**

**Company Name:** Indiana Department of Transportation  
**Address City IN Zip:** 120 South Shortridge Road, Indianapolis, IN 46219  
**Permit Number:** R097-13755-00284  
**Plt ID:** 097-00284  
**Reviewer:** Holly Stockrahm  
**Date:** 26-Aug-03

| HAPs - Organics               |                    |                          |                         |                   |                    |
|-------------------------------|--------------------|--------------------------|-------------------------|-------------------|--------------------|
| Emission Factor in lb/MMcf    | Benzene<br>2.1E-03 | Dichlorobenze<br>1.2E-03 | Formaldehyde<br>7.5E-02 | Hexane<br>1.8E+00 | Toluene<br>3.4E-03 |
| Potential Emission in tons/yr | 6.181E-05          | 3.532E-05                | 2.208E-03               | 5.298E-02         | 1.001E-04          |

| HAPs - Metals                 |                 |                    |                     |                      |                   |
|-------------------------------|-----------------|--------------------|---------------------|----------------------|-------------------|
| Emission Factor in lb/MMcf    | Lead<br>5.0E-04 | Cadmium<br>1.1E-03 | Chromium<br>1.4E-03 | Manganese<br>3.8E-04 | Nickel<br>2.1E-03 |
| Potential Emission in tons/yr | 1.472E-05       | 3.238E-05          | 4.121E-05           | 1.118E-05            | 6.181E-05         |

Methodology is the same as page 1.

The five highest organic and metal HAPs emission factors are provided above.  
Additional HAPs emission factors are available in AP-42, Chapter 1.4.